

WHAT IS CLAIMED IS:

1                   1.     A process for reclaiming residual unreacted ethylene when  
2     preparing copolymers via free-radical-initiated polymerization of one or more vinyl  
3     esters, ethylene, and optionally other ethylenically unsaturated monomers  
4     copolymerizable therewith, at a pressure of from 5 to 100 bar absolute in an aqueous  
5     medium by emulsion or suspension polymerization, comprising depressurizing the  
6     reaction mixture to a lower pressure of from 0.1 to 5 bar absolute, compressing the  
7     gas phase with the residual ethylene-containing gas to a higher pressure of from 2  
8     to 20 bar absolute, and absorbing the gas phase into one or more vinyl esters, and  
9     reusing the resultant mixture in further polymerization.

1                   2.     The process of claim 1, wherein ethylene is absorbed into  
2     vinyl esters in a mixing ratio of from 0.1 to 10% by weight of ethylene, based on  
3     the weight of vinyl esters.

1                   3.     The process of claim 1, which is a continuous process or a  
2     batch process.

1                   4.     The process of claim 2, which is a continuous process or a  
2     batch process.

1                   5.     The process of claim 1, wherein the polymerization process  
2     is terminated at a conversion of from 95 to 99% by weight of the monomers which  
3     are liquid under polymerization conditions, prior to said step of depressurizing.

1                   6.     The process of claim 2, wherein the polymerization process  
2     is terminated at a conversion of from 95 to 99% by weight of the monomers which  
3     are liquid under polymerization conditions, prior to said step of depressurizing.

1                   7.     The process of claim 3, wherein the polymerization process  
2     is terminated at a conversion of from 95 to 99% by weight of the monomers which  
3     are liquid under polymerization conditions, prior to said step of depressurizing.

1                   8.     The process of claim 4, wherein the polymerization process  
2     is terminated at a conversion of from 95 to 99% by weight of the monomers which  
3     are liquid under polymerization conditions, prior to said step of depressurizing.

1                   9.     The process of claim 1, wherein the monomers polymerized  
2     are selected from the group consisting of a mixture of vinyl acetate and ethylene, a  
3     mixture of vinyl acetate and at least one different vinyl ester and ethylene, and a  
4     mixture of vinyl chloride, ethylene and one or more vinyl ester(s).

1                   10.    The process of claim 1, wherein said lower pressure is from  
2     0.1 to 1 bar absolute.

1                   11.    The process of claim 1, wherein said higher pressure is from  
2     5 to 10 bar absolute.

1                   12.    The process of claim 10, wherein said higher pressure is from  
2     5 to 10 bar absolute.